

**ABSTRACT**

A system 10 for continuously monitoring the integrity of a structure 14 includes a sensor pad 16 having a surface 18. The surface 18 is provided with a set of first channels 22 and interspersed second channels 24. Surface 18 is sealed onto the surface 12 of structure 14 so that the channels 22, 24 together with surface 12 form respective sets of first and second cavities 26 and 28. The first cavities 26 are placed in fluid communication with a vacuum source 101 via a third channel 30. The second cavities 28 are vented to the atmosphere via a fourth channel 34, through hole 35, and conduit 36. A high impedance 102 is placed in series between the vacuum source 101 and the first cavities 26. A differential pressure transducer 103 is connected across the high impedance 102 and monitors for change in vacuum condition between the vacuum source 101 and the vacuum in the cavities 26. If a fault 40 were to develop in structure 14 opening onto surface 12 and propagate to form a fluid communication path between one of the cavities 26 and adjacent cavity 28 there will be a change in the vacuum condition of the cavity 26 which will be detected by the transducer 103.